

Bruises, Vegetables, Life Extension

BY DURK PEARSON AND SANDY SHAW

What does a black-and-blue bruise on your leg have to do with the greenness of a package of frozen Brussels sprouts? And what do either of these have to do with life extension? Plenty!

When you open up that package of frozen vegetables, such as Brussels sprouts, you are immediately struck by the almost unnaturally green color. But that color is not painted on. It is real. The reason the sprouts have not turned a drab brownish-green color, as they do naturally, is that they have been bathed in an EDTA solution before packaging. EDTA is a commonly used food additive, a chelating agent that removes heavy metals (such as copper and iron) from the surface of green vegetables.

Chelate comes from the Greek word for "claw"; chelating agents chemically capture and bind many metal ions. Copper and iron in the leaves catalyze (stimulate) the production of free radicals during the oxidation of many of the plant's constituents as it ages after harvesting. These free radicals are what normally make green vegetable matter wilt (by damaging the cell walls) and turn brown after death. In fact, the lovely colors leaves turn in the fall come about partly as a result of free radical reactions. First, the chlorophyll in the leaves is destroyed by free radicals. The leaves are then beautifully colored by the carotenoids (such as yellow beta carotene in carrots) they contain. Finally, the carotenoids themselves are destroyed by free radicals, and the leaves turn brown.

Free radicals are highly chemically reactive entities with an unpaired electron, which are created in the bodies of animals and plants while they are alive and even after they die. Because these free radicals are required for many necessary biochemical reactions, both plant and animal organisms have developed an array of protective enzymes (including superoxide dismutase, glutathione peroxidase, and catalase) and antioxidant nutrients (including vitamins A, B-1, B-5, B-6, C, E, the amino acid cysteine, and the minerals zinc and selenium) to protect themselves against free radical damage. When these radicals get out of control, they can do serious damage to cellular fats, proteins, DNA, and RNA, causing cell death or even

cancer. Free radicals are a major mechanism of damage that causes our own aging.

But back to the Brussels sprouts for a moment. What is the relation of the browning of the sprouts to your bruise? The copper and iron that catalyze free radical production in the sprouts do the same in crushing injuries that cause blood (which contains lots of iron and copper) to leak into the tissues from broken capillaries. Those black, blue, and yellow colors in a bruise are created by the uncontrolled chemical attack of free radicals on substances in the tissue. Chelating agents—which bind, inactivate, and remove these heavy metals from an injury—can greatly reduce the damage and speed healing.

Spinal cord injuries, far more serious than mere bruises, have been successfully treated with D-penicillamine, a powerful chelating agent. It is possible to dramatically reduce the degree of paraplegia that would ordinarily result from an experimental spinal cord injury in cats by prompt injection of D-penicillamine. By chelating the heavy metals in the injured area, the D-penicillamine inhibits the development of a free radical chain reaction that can literally destroy the spinal cord tissue by converting the highly polyunsaturated lipids (fats and oils) there into organic peroxides, generating more free radicals in a chain reaction. Without chelation of the iron and copper leaking from the hemolyzing (breaking down) red blood cells that have escaped from broken capillaries, free radical activity in the crushed area increases by more than 100,000 times within four hours! D-penicillamine has also been used in the successful treatment of some cases of severe rheumatoid arthritis.

Caution: D-penicillamine chelation therapy should be done *only* by a physician experienced in this type of therapy. (A different compound, L-penicillamine,

is a very dangerous substance and can be lethal.)

Chelation has been tried successfully for extending the life span of experimental animals. Sincock and his coworkers treated microscopic organisms (the rotifer *Mytilina brevispina*) by immersing them briefly in solutions of one of the chelating agents sodium citrate, sodium tartrate, EDTA, and EGTA. Their lives were extended by all the treatments—up to 75.9 percent with EGTA. The treated rotifers did not accumulate nearly as much calcium with age as the untreated rotifers did.

Chelating agents are now being used to treat people for a number of conditions. In heavy metals poisoning, such as lead intoxication, the combination of EDTA and vitamin C has been found particularly effective, especially in removing lead from the brain, where it does the most harm. Vitamin C alone helps prevent the buildup of heavy metals by helping to keep them in solution in the blood, where they can be eliminated via the urine.

Some good results have been obtained with EDTA chelation therapy for atherosclerosis in cases where there are abnormally high plasma lipids. Plasma lipid levels were lowered to normal or near normal in some patients who had elevated levels. Plasma levels returned to their original levels after EDTA therapy was stopped but fell again when it was reinitiated. In atherosclerosis patients with normal plasma lipid levels, there was little or no plaque reduction with EDTA.

Recently, a chelated form of copper, copper salicylate, has been found very effective in interacting with superoxide free radicals, thereby preventing much of their damaging effects to synovial fluids and joint membranes in some types of arthritis (for example, rheumatoid arthritis). The antiinflammatory effects of aspirin work in a similar way by inhibiting the synthesis of inflammatory prostaglandins that are formed via a free radical route. These copper salicylates work much like the natural antiperoxidase-free radical enzyme superoxide dismutase (SOD) and are sometimes called artificial superoxide dismutases.

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We invite questions of general interest from our readers. Send your query along to REASON Health & Welfare, Box 40105, Santa Barbara, CA 93103.

(A limited number of reader questions can be answered in print; personal replies cannot be made.)

Investment Tips for the New Year

BY STEVEN K. BECKNER

As the first year of the Reagan presidency draws to a close amid mounting dissension and controversy, markets here and, indeed, all over the world have sunk into one of the most pessimistic moods in memory. Uncertainty has given way to despair as the promise of Reaganomics has, seemingly, gone aglimmering with the onset of recession.

The stock market drifts lower, while commodities continue to languish. Real estate, precious metals, diamonds—almost everywhere you look, investments are in a slump. And, as usual, the US shock waves have reverberated abroad, afflicting even the dynamic Asian stock and property markets.

The best investment continues to be high-yielding US-dollar money market instruments: Treasury bills, commercial paper, certificates of deposit, and money market funds. But now, even that haven is threatened, as the Federal Reserve's tight money policy at last begins to bear the fruit of lowered interest rates.

But therein may lie the clue to investment strategy for 1982. First a word of explanation, for some might not agree with the foregoing assessment. Tight money leading to lower interest rates? True, up until recently the hallmark of Fed Chairman Paul Volcker's tight money policy has been high interest rates. But those interest rates were as much an expression of inflationary expectations as of Fed tightness. Not that the Fed hasn't been relatively tight. It has kept well within its targets for moderate monetary growth.

The result has been a significant diminution in inflationary expectations. While the consumer price index was actually higher in the third quarter than in the previous ones, the wholesale price indices presage lower retail prices for 1982. So interest rates are coming off, and the bond market is showing a corresponding rally.

A bond rally traditionally presages a stock market rally. Whether that happens in 1982 depends on the depth of the recession, and that in turn depends on how the economy at last reacts to the first installment of the Reagan tax cuts. (With all the announcements of the failure of Reaganomics, you'd never know that the tax cuts, such as they are,

don't begin to take effect until 1982.)

Whenever there is such a loud chorus of moans and groans it is good to take stock of the situation. It is doubtful whether the recession will be as severe as most seem to think. And if it's not, it may indeed be a very good time to "take stock."

The market is replete with bargains in many sectors. Generally speaking, smaller, well-capitalized, technology-oriented companies whose shares are underpriced relative to underlying net asset value should have the greatest potential. Such companies are most likely to profit from the liberalized depreciation rules by investing in productive new plant and equipment.

Since the next year, at least, will be one of great uncertainty—due to doubts about the inflationary impact of projected budget deficits—the US stock market is not the only place to be.

For one thing, give stronger consideration to selected foreign securities. Asia-Pacific stock markets, which have suffered bigger setbacks than the US market in the past six months, should be due for a major recovery later in 1982. When the time comes, the markets of Hong Kong, Singapore, and Japan have a record of exciting performance.

The barrier, again, is US recession, however. Those trade-oriented economies suffer from slackened US and Western European demand for their exports. Even so, awakening Western interest in those markets make them a good place to put a fraction of your portfolio.

Falling interest rates, mixed with continued long-term inflation fears, could finally pull precious metals and other commodities out of their doldrums. After two years of digesting the January 1980 binge, gold and silver should be ready to test new ground by mid-1982.

Other commodities could follow. Lumber, for instance, should benefit from renewed housing demand as interest rates fall. Long positions in future contracts with distant delivery months for such things as copper in anticipation of the eventual recovery in industrial and consumer demand also make sense. An alternative to commodity futures are resource-based stocks, including those of Australia. There can be little further downside price risk in this area.

A final area of interest is foreign currencies. As stated in this space last year, the US dollar is overvalued. That judgment has already proven correct with respect to the Swiss franc, which appreciated some 20 percent in a three-month period through early November. The dollar, at this writing, is still overvalued relative to the German mark, Japanese yen, and others, in view of our deteriorating balance of payments. Time deposits of securities denominated in these currencies are a good hedge against the US dollar and good speculations as well.

Steven Beckner is a free-lance financial writer, the assistant editor of World Money Analyst, and the author of The Hard Money Book.

QUOTABLE QUOTES

... the exercise of any right requires the use of property. Without real property, there is no place to stand, sit, lie, walk, ride or do anything. ...

... without the container we can make no soup, without a place to stand there can be no speech, without a canvas (or other receptacle) there can be no painting, without the paper the words cannot be assembled, and without the ground the man has no place to walk.

—Clarence B. Carson, *The Freeman*

Pig power in America was infuriating—but pig power in the Communist framework was awesome and unaccountable. No protection by outbursts in the press and electronic media—the Reds owned it. No shelter under the benevolent protection of a historic constitution—the Marxists held the book and they tore out the pages that sheltered you.

—Eldridge Cleaver, *Soul on Fire*

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